

# BUTTE FAA AIRPORT

## SILVER BOW COUNTY

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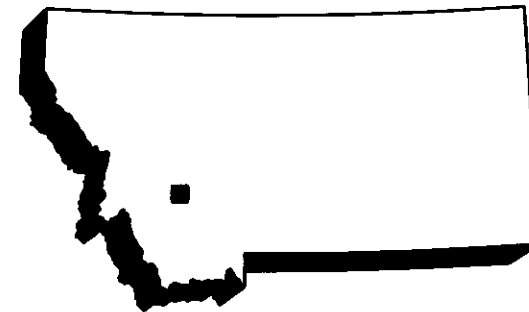
The Butte Airport is located approximately 4 miles south-southeast of Butte at 45 57 00 N and 112 30 00 W (Site No. 117 on Map II-1). Elevation at the airport is 5,540 feet. Meteorological data have been collected at this site for many years by the Federal Aviation Administration.

These data, primarily collected for aviation and weather forecasting uses, consist of short-term (5 minutes or less) averages of wind speed and wind direction, as well as other meteorological parameters. Data were gathered once per hour. The data have been analyzed by Battelle Pacific Northwest Laboratories.

The Battelle data set for Butte consists of summaries derived from hourly observations from January 1, 1948, through December 31, 1960. The anemometer was mounted on a rooftop at a height of 18.0 meters. Due to the area's complex terrain, the site is representative only of a limited area near the airport.

Average monthly wind speed at the site ranged from 6.7 miles per hour in December and January to 9.8 miles per hour in April. Average annual wind speed was 8.1 miles per hour.

Average monthly wind power ranged from 67.0 watts/m<sup>2</sup> in August to 136.0 watts/m<sup>2</sup> in April. Average annual wind power was 90.0 watts/m<sup>2</sup>.



**Table IV - 148**  
**Monthly Wind Speed Distribution**  
**SILVER BOW COUNTY - BUTTE FAA AIRPORT**  
**01/01/48 - 12/31/60**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
CALM (<1.1)	20.7	19.2	16.0	10.7	9.5	9.0	11.0	12.5	13.4	15.7	20.3	24.7	15.2	CALM (<0.5)
1.1- 3.1	8.2	7.7	6.4	5.7	4.4	4.6	5.9	4.2	5.9	6.8	7.1	6.3	6.1	0.5- 1.4
3.4- 5.4	25.2	23.1	24.1	18.4	19.0	20.3	21.5	22.6	23.6	21.5	20.1	20.9	21.7	1.5- 2.4 S
S 5.6- 7.6	13.1	12.1	13.1	12.2	14.2	15.4	17.0	17.1	15.7	15.9	14.1	13.8	14.5	2.5- 3.4 P
P 7.8- 9.8	8.0	8.1	9.7	9.9	11.7	12.4	12.6	12.2	11.1	9.9	10.1	9.4	10.4	3.5- 4.4 E
E 10.1-12.1	7.1	7.8	8.1	10.6	11.0	11.2	11.3	10.6	10.1	8.9	8.8	6.8	9.4	4.5- 5.4 E
E 12.3-14.3	3.9	5.0	4.7	6.9	7.2	7.0	6.3	6.4	5.6	5.2	4.9	4.2	5.6	5.5- 6.4 D
D 14.5-16.6	3.5	4.7	4.7	6.5	6.6	6.2	4.8	4.9	4.7	4.4	4.3	4.0	4.9	6.5- 7.4
16.8-18.8	2.7	3.6	3.9	5.8	5.5	5.1	3.5	3.7	3.8	3.9	3.7	3.3	4.0	7.5- 8.4 M
M 19.0-21.0	2.3	3.1	3.1	4.5	3.6	3.5	2.4	2.6	2.7	2.8	2.3	2.0	2.9	8.5- 9.4 E
I 21.3-23.3	1.4	1.7	2.1	3.2	2.5	2.1	1.2	1.5	1.4	1.9	1.5	1.5	1.8	9.5-10.4 T
L 23.5-25.5	1.4	1.5	1.2	2.3	1.8	1.3	1.0	0.7	1.0	1.3	1.1	1.3	1.3	10.5-11.4 E
E 25.7-27.7	1.3	1.2	1.5	1.6	1.6	1.1	0.8	0.5	0.6	0.8	0.8	0.9	1.1	11.5-12.4 R
S 28.0-30.0	0.5	0.5	0.6	0.9	0.6	0.6	0.4	0.2	0.3	0.5	0.5	0.4	0.5	12.5-13.4 S
/ 30.2-32.2	0.3	0.1	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	13.5-14.4 /
H 32.4-34.4	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.0	0.1	0.2	0.3	0.1	0.2	14.5-15.4 S
O 34.7-36.7	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	15.5-16.4 E
U 36.9-38.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	16.5-17.4 C
R 39.1-41.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.5-18.4 O
41.4-43.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.5-19.4 N
43.6-45.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.5-20.4 D
45.9-56.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.5-25.4
57.0-68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.5-30.4
68.2-79.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.5-35.4
79.4-90.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.5-40.4
>90.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	>40.4
AVERAGE SPEED (MPH)	6.7	7.4	7.8	9.8	9.4	8.9	8.1	7.8	7.6	7.6	7.2	6.7	8.1	
AVERAGE SPEED (M/SEC)	3.0	3.3	3.5	4.4	4.2	4.0	3.6	3.5	3.4	3.4	3.2	3.0	3.6	
AVERAGE WIND POWER (WATTS/M**2)	84.0	96.0	101.0	136.0	118.0	97.0	73.0	67.0	70.0	85.0	83.0	76.0	90.0	

ANEMOMETER HEIGHT = 59.0 FEET = 18.0 METERS

SOURCE: BATTELLE PACIFIC NORTHWEST LABORATORIES

# BUTTE HEBGEN PARK

## SILVER BOW COUNTY

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The Hebgen Park site is located in the southeastern corner of Hebgen Park in Butte at 46 00 13 N and 112 31 29 W (Site No. 118 on Map II-1). Elevation at the site is 5,520 feet. The site was established by the Montana Air Quality Bureau to measure concentrations of particulates, carbon monoxide, and nitrogen dioxide as part of the Montana Air Pollution Study.

Wind data from June 15, 1978, through December 10, 1980, were available for analysis. The data set contains hourly averages of wind speed and wind direction. The data were recorded by a data acquisition system, which scanned each measured parameter several times per minute. The wind recorder used was a Climatronics electronic anemometer and wind vane on a 10-meter tower.

Winds were monitored long enough to adequately represent the wind resource at this location. Since the site is in an urban area in complex terrain, the data are representative only of the immediate vicinity. Data recovery was fair, ranging from 35.5 percent in January to 98.7 percent in November. Overall data recovery was 75.2 percent.

Average annual wind speed at the site was 3.7 miles per hour. Average monthly wind speeds ranged from 2.8 miles per hour in November and February to 4.6 miles per hour in June. May through July were the windiest months.

Average annual wind power was 8.9 watts/m<sup>2</sup>. Average monthly wind power values ranged from 2.7 watts/m<sup>2</sup> in February to 13.2 watts/m<sup>2</sup> in June.

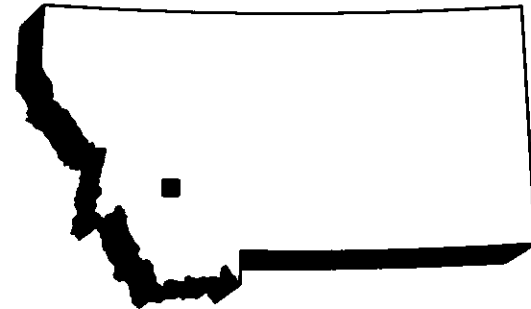


Table IV - 149  
 Monthly Wind Speed Distribution  
**SILVER BOW COUNTY - BUTTE HEBGEN PARK**  
 06/15/78 - 12/10/80

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
	CALM	2.1	0.4	2.3	1.2	1.6	0.2	0.0	0.0	0.0	0.2	1.0	2.4	0.8	CALM
	0.1-1.0	19.7	2.1	8.2	8.5	2.5	2.0	1.4	0.8	2.1	8.6	14.9	14.1	6.9	0.1- 0.4
	1.1-2.0	28.2	35.1	19.7	22.3	20.1	18.6	22.2	30.0	30.4	35.4	33.0	26.8	27.0	0.5- 0.9
S	2.1-3.0	21.2	37.2	19.5	19.2	19.5	23.0	22.8	22.5	20.0	18.9	22.3	20.0	21.5	1.0- 1.3
P	3.1-4.0	1.1	3.5	8.4	7.7	7.3	7.2	8.5	7.9	8.8	5.2	5.7	6.6	6.8	1.4- 1.8
E	4.1-5.0	10.8	10.2	11.8	10.3	11.8	12.6	12.8	12.6	8.1	8.5	7.6	7.8	10.2	1.9- 2.2
E	5.1-6.0	0.6	1.2	4.8	4.8	7.3	6.4	4.2	5.6	5.0	4.3	2.8	2.9	4.4	2.3- 2.7
D	6.1-7.0	5.5	7.9	7.9	5.9	7.4	7.4	10.3	6.7	6.7	5.1	3.8	5.8	6.6	2.8- 3.1
	7.1-8.0	0.6	0.4	3.6	3.8	4.8	3.8	2.9	3.2	4.3	3.1	2.7	1.7	3.1	3.2- 3.6
M	8.1-9.0	4.5	1.7	7.0	6.6	6.3	6.0	7.3	4.9	6.2	3.8	2.8	4.1	5.1	3.7- 4.0
I	9.1-10.0	0.2	0.2	0.3	1.4	3.2	2.0	1.5	1.2	1.7	0.8	0.3	1.3	1.3	4.1- 4.5
L	10.1-11.0	3.0	0.2	3.8	3.9	3.0	4.2	3.9	2.5	3.7	2.2	1.1	2.7	2.9	4.6- 4.9
E	11.1-12.0	0.0	0.0	0.4	1.3	2.0	1.7	0.4	0.7	1.2	0.7	0.2	0.7	0.8	5.0- 5.4
S	12.1-13.0	1.3	0.0	1.9	1.4	1.4	2.4	1.4	0.8	1.2	1.4	0.7	1.2	1.3	5.5- 5.8
/	13.1-14.0	0.0	0.0	0.0	0.4	0.8	1.2	0.2	0.1	0.3	0.4	0.3	0.2	0.4	5.9- 6.3
H	14.1-15.0	1.1	0.0	0.4	1.2	0.6	0.7	0.3	0.3	0.1	0.7	0.2	0.8	0.5	6.4- 6.7
O	15.1-16.0	0.0	0.0	0.0	0.1	0.2	0.4	0.0	0.1	0.2	0.1	0.4	0.2	0.2	6.8- 7.2
U	16.1-17.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.2	0.2	0.1	0.2	0.1	7.3- 7.6
R	17.1-18.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.0	7.7- 8.0
	18.1-19.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.0	8.1- 8.5
	19.1-20.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	8.6- 8.9
	20.1-25.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0-11.2
	25.1-30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3-13.4
	30.1-35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.5-15.6
	35.1-40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.7-17.9
	>40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	>17.9
	AVERAGE														
	SPEED (MPH)	3.0	2.8	3.9	4.0	4.4	4.6	4.2	3.7	3.9	3.4	2.8	3.3	3.7	
	AVERAGE														
	SPEED (M/SEC)	1.3	1.2	1.8	1.8	1.9	2.1	1.9	1.6	1.7	1.5	1.2	1.5	1.7	
	AVERAGE														
	WIND POWER														
	(WATTS/M**2)	7.4	2.7	9.3	10.8	11.7	13.2	9.1	6.9	9.0	8.5	5.4	9.5	8.9	
	PERCENT DATA														
	RECOVERY	35.5	37.9	51.8	77.2	88.7	87.5	86.3	66.7	59.3	94.0	98.7	95.1	75.2	

ANEMOMETER HEIGHT = 10 METERS = 33 FEET  
 NUMBER OF OBSERVATIONS = 16435  
 PERCENTAGE DATA RECOVERY = 75.2

SOURCE: GEORESEARCH, INC.